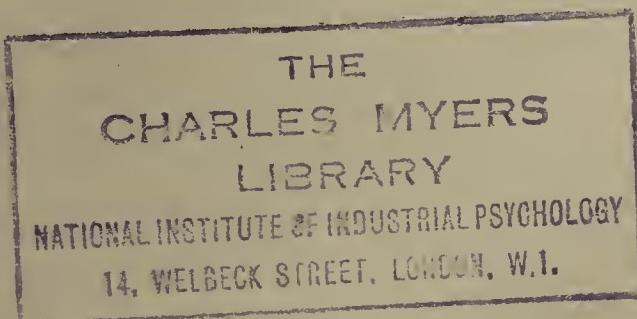


THE INDEPENDENCE OF PSYCHOLOGY

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IN his address to the Subsection of Psychology last year, Dr. Rivers dealt with recent advances in our understanding of mental disorders and their treatment. Since the war, my immediate interests have been turned from this to another field of applied psychology, namely to industrial psychology: but as my work in it has lain rather in the direction of organisation than of personal research, I have decided to leave this subject to the contributors of the seven papers bearing on it, which will later come before this Subsection, and to turn to a broader problem for my address—the general position of psychology at the present day, particularly in relation to physiology. In the choice and treatment of this theme I have been influenced, first by the unanimous opinion of psychologists that the time has come for the institution of a separate section of this Association devoted to Psychology, and secondly by the fact that a discussion between physiologists and psychologists has been arranged to follow my address, in order that this opinion may be fully debated.

It is perhaps superfluous to point to the growing interest in and importance of psychology during the past four or five years, whether as illustrated by the recent increase of membership of the British Psychological Society to upwards of six hundred persons, by the noteworthy applications of psychology to warfare, medicine, education, industry, and other social problems, by the recognition of psychology as one of the subjects for a Degree in Science at several of our Universities, by the establishment of University Boards of Psychological Studies, or by the striking increase in the number of students attending lectures and engaged in research in psychology since the war.

Psychology is now recognised as a distinct subject of study, with methods and aims of its own, which are quite different from those of philosophy or of physiology—the two studies to which it owes most, for its inception and for its emancipation respectively. Freed from its long tutelage under philosophy, it has at length been able to assume the character and the aims of *Modern Science*, which, as Dr. Singer has recently pointed out,² unlike the Science of the Greeks, did not arise as an offspring of philosophy, but only later began to form an alliance with it. As a modern science, psychology is able

¹ An opening address to the Subsection of Psychology at the Cardiff Meeting of the British Association, 1920.

² In his Inaugural Lecture, *Greek Science and Modern Science*. London: University of London Press, 1920.

to lay aside such metaphysical problems as the relation of mind to body, with its implications of materialism, idealism, parallelism, interactionism, determinism, and free-will. The views which psychologists may hold on the problem of the mind-body relation will interfere no more with the progress of scientific psychology than the conflicting views on vitalism and mechanism interfere with the progress of physiology. There are many who believe that such problems will never be solved by the methods of natural science. But all are agreed that, whatever opinions an investigator may hold in regard to them, those opinions need not hinder him, any more than his religious opinions, from advancing his subject by scientific research.

Freed also now from the scientific leading-strings of physiology, psychology is able to devote itself purely to the study of mental processes, their functions, relation, and natural history, the results of their synthesis and analysis, their growth and decay in the individual, their comparison and evolution in the race, species, and genus, and their abnormal variations, in excess or defect, due to heredity, disease, drugs, or injury. Psychology now studies mental processes for their own sake, neither because of their interest for metaphysicians in support of some wide-cast theory of knowledge, of reality, or of the universe, nor because of their interest for physiologists who seek to determine the functions of living substance.

Most of us, not all perhaps, have passed beyond the stage of crass materialism, when the mind was regarded as the "function" of the brain—secreted by nerve cells just as the cells of the liver secrete bile. We now recognise that it is the nervous impulse, not the mental process, that results physiologically from the activity of the neuron,³ and that it is the nervous impulse which is the subject of study of neural⁴ physiology. It is, of course, always interesting and often valuable to correlate nervous and mental processes; but, so long as we are ignorant of the nature of their interrelation, the two must be kept separate and not confused. Anyone who speaks of a sensation ascending a nerve, or of a thought passing through the brain, at once betrays his incompetence.

The independence of psychology and physiology is further illustrated by the different sources from which the former has obtained its recruits. Neither Francis Galton, the father of experimental human psychology in this country, nor Lloyd Morgan, one of the fathers of experimental animal psychology, could be called physiologists. Nor, on the Continent, had the versatile Fechner or the physicist Mach received physiological training. Moreover, some of the most recent advances of psychology, due especially to the work of Janet,

³ The nerve cell with its processes.

⁴ Relating to the nervous system.

Freud, Jung, and Morton Prince, have been made quite independently of physiological foundations and physiological considerations.

Let us realise, then, that the nervous system can be studied for its own sake by the physiologist, that the mental system can be studied for its own sake by the psychologist, and that the relation between neural and mental processes is the concern of a fascinating border science, physiological psychology, in which physiology and psychology are deeply interested, from which each may (with due precaution) derive considerable help, but in which each is only secondarily concerned.

When, nearly twenty years ago, I began to teach experimental psychology, it was generally confused with the physiology of the sense organs, and reaction times. During that period I have naturally adhered closely to the general lines of my predecessor and teacher, Dr. Rivers, who was probably the first, in Europe at least, to introduce a really systematic practical course of experimental psychology into the laboratory. His pupils began by studying the simplest and most abstract processes, sensations—proceeding thence to illusions, memory, and so on. To-day I feel by no means sure that this is any longer the best method of beginning the subject, so great has been the advance within recent years in the experimental investigation and in the scientific observation of other mental processes. The objects of the teacher of psychology must be first to train his pupils in discerning the varied material with which they will have to deal, and next to train them in scientific method. I am disposed to think that sensations afford a less easy and less interesting theme for introspection than, say, ideas or thoughts. I believe that, at all events in the biological sciences, of which psychology forms a part, it will often prove a mistaken procedure to begin with the study of apparently the most simple object, which is often that which we have come to know last, about which we know least, and which is often, by reason of its very simplicity, the most abstract or remote from everyday experience. We owe this principle of instruction, I suppose, to the age of scholasticism, which confused the formal laws and operations of Logic with the mental processes actually employed in reasoning, and the rules of grammar with the speaking of language. We are at length recognising that, inasmuch as the grammar of language and the scales of music were not formulated until ages after speech and melody had been in use, a foreign language should not be taught by first learning the basic rules of grammar, nor should music be taught by beginning with scale practice. The last to be abstracted cannot be the first to be taught. For this and other reasons I would suggest that the study of psychology should begin with a preliminary survey of the more advanced mental processes, the more familiar, the

more interesting, and the more alive in tendency to action and in wealth of introspection: I mean the flow of thoughts. The prominence of individual mental differences would be thus forced early on the student's notice, and at the outset he would be trained in analysis and in recognising the enormous importance of affection, emotion, conation, of instinctive and unconscious mental activity, and in the effects of suggestion, fore-knowledge, etc. Having thus learnt the general groundwork of his subject, the student would then receive instruction in the psycho-physical and statistical methods, a knowledge of which is so essential for the avoidance of pitfalls in psychological experiment. It is mainly due to their ignorance or neglect of the psycho-physical methods that those experienced in research in other branches of natural science are apt to fail so egregiously when they attempt to carry out investigations involving the action of mental processes, e.g. in colour vision, in mental fatigue, and most strikingly in so-called "psychical research," which has fallen almost wholly into the hands of the psychologically untrained. The psycho-physical methods are most easily practised and mastered in the sphere of sensory experience.

Before he begins the study of psychology, the student should have learnt the elements of physics and biology, and he should have then attended a course of elementary physiology and a course of elementary philosophy, so as to avoid subsequent confusion of scientific psychology with either, and so as to recognise the deep interest of psychology in both.

There is a correspondence, but not, I think, any connection, between the importance which experimental psychology at one time attached to the study of sensation and the great stress laid by philosophers, in the pre-experimental phase of psychology, on the sphere of the intellect. In the world's history, philosophical speculation has always preceded scientific experiment and analysis. Natural science, which demands greater patience, self-control, and impartiality, has only made real progress during the last two or three centuries, whereas philosophical thought and speculation have been able to flourish from remote antiquity. The subject-matter of psychology formed but a fraction of the wide sphere of interests of the metaphysician, who considered himself qualified and in duty bound to philosophise on every branch of knowledge. It is little wonder, then, that the framers of such world-wide hypotheses overlooked psychological facts that did not easily fit into them, and neglected to observe those which were not of immediate interest. They laid little stress on instinct and suggestion: their consideration of the unconscious was practically limited to the recognition of habit and of the mental "dispositions" left behind from previous experience. Somewhere the "will" had

to find a place between cognition¹ and action : in a vague way they supposed willed action to have been developed out of impulsive and ideo-motor action through self-activity, but their reflections (often prejudiced, doubtless, by conceptions of free-will, moral responsibility, immortality, etc.) carried them hardly further than this. The emotions were introduced haphazard into their psychological scheme, without any clear relation to the cognitive, affective, and conative divisions into which they had already divided their subject.

An escape from this "intellectualistic" atmosphere was offered by the conception first developed by our fellow-countryman, Shand, of the nature and importance of what he called "sentiments," and a little later by the publication by McDougall of his *Introduction to Social Psychology*²—in which (as Stout had previously done) he included Shand's ideas in his own elaborate treatment and classification of the instincts and emotions. McDougall insisted on the enormous biological and social importance of the emotions, on the closeness of their relation to instinctive and conative action, and on their characteristic, often irresistible, force. Shand had brought cognition into fusion with emotion under the name of "sentiment," which he gave to a past experience that had by association with emotion left behind a cognitive, set in a background of emotional, disposition. Thus a cognitive experience, whether it be a percept such as of one's pipe, or a concept such as of one's native land, comes to have "value" and to be endowed with emotional experience and force. One's pipe, when broken, at once produces the emotion and the expression of sorrow ; one's patriotism, when put to the test, at once evokes attack or defence and the emotions of anger, tenderness, etc. A sentiment is thus a system of past ideas or percepts, set in a halo of definite emotional dispositions with which they have by past experience become associated. A sentiment comes to have far greater force than a mere idea or percept, devoid of such emotional halo.

Still later Shand's notion of sentiment received important and independent development at the hands of Freud. Psychologists had already recognised that mental processes tend to recur, not only by virtue of their previous association with other mental processes, but also by virtue of their inherent and retained energy. The importance of association had long been known, and had somewhat retarded full recognition of the process of "perseveration," the tendency of past experiences spontaneously to recur, to force themselves again into consciousness by virtue of their inherent indomitable energy. Such perseveration occurs especially in the case of exciting emotional experience. One who has

just fallen in love or suffered a bereavement is powerless, try as he will, to avoid the intrusion of the person, the scenes, and the emotions related to his new experience, into his workaday life. But when the system of ideas with which such an emotional disposition is connected becomes inhibited or "repressed," the emotion only gathers force as it meets the opposing force. The system can no longer directly express itself in action, nor can it rest relatively in peace as a "sentiment." Coincident with its repression, it becomes a "complex."³ The repression or inhibition occurs through an incompatibility or a conflict that would be involved, through an unpleasantness and discordance that dare not be faced. For this reason, as a complex, it becomes consciously or unconsciously "repressed" (as we say) into the unconscious. It may lie buried there in total oblivion, absolutely irrevocable save through the agency of some special mental exploration, e.g. by psycho-analysis or under hypnosis, which succeeds by reducing the repressing force. Or the complex may be imperfectly repressed. In that event, the energy of the emotional part of the repressed complex may be expended through its "dissociation" from that system of ideas or percepts with which it was originally connected. The emotion may then escape in the form of unreasoned emotion, say of fear or anxiety, unattached to any special object. Or, more often, it may become attached to some other, more or less analogous, object. The original scene, when the complex is imperfectly repressed, may itself recur whenever inhibition is reduced as in sleep ; but even in dreams the scene may recur only in a distorted or symbolic form, in order, apparently, to elude the forces of inhibition successfully.

Into the unconscious we are perpetually, more or less unconsciously, banishing percepts and ideas which are incompatible and discordant with our general mental life. From the unconscious emerge not only complexes or parts of complexes which have been thus repressed, but also new formations, e.g. the creations of the genius or inventor, which are then presented to his conscious mind for judgment, approval, and elaboration.

Thus the importance of the unconscious becomes at least as great for psychology as that of the conscious. At first sight, the critical psychologist may hesitate to regard the unconscious as "mental," preferring to consider it in terms of "physiological" traces, or dispositions, left behind in central nervous tissue, which can only be termed "mental" in the presence of consciousness. But the results of investigations by psycho-analysis and under hypnosis, of studies of disordered, alternating, and multiple personality, automatic writing, etc., must finally force the impartial psychologist to

¹ The act of apprehending.

² Published by Methuen, 15th edition, 7s. 6d.

³ A system or group of experiences bearing upon one central idea, the whole or part of which system is repressed.

endow the unconscious, like the conscious, with a mental aspect. They convince him of the necessity for displacing consciousness from the pinnacle it has hitherto occupied in psychology. Unconsciousness is no longer a mere "fringe" around the field of consciousness. It becomes the basis, the foundation on which consciousness depends—the nourishment from which it draws its very existence. We begin to see the "superficiality" of consciousness, and to recognise that almost any mental event may happen with or without the accompaniment of personal consciousness. Such consciousness has been evolved to facilitate choice between alternative reactions—to bring the entire unity or personality of the organism into more complete relation with its environment. Where only one reaction is possible, the action remains a reflex, and no sensation or impulse need be felt. Where the reaction is to some extent modifiable, the action becomes instinctive—emotional activity, impulsive tendencies, and crude blurred sensations being experienced. Where alternative responses are desirable, discrimination becomes acute and a larger and more dominating self develops—a dominating apical system which endeavours to permit of action only after it has given its consent or sanction: thus arise the beginnings of will.

We now recognise that the consent and sanction of the self to a volitional act are but the reaction of an apical mental system to the sum total of conflicting and favourable tendencies to action; that every seemingly unaccountable thought and action are traceable to a "cause," and that the "reasons" offered by the self for a course of thought or action are often mere illusory explanations, unconsciously later coined as excuses for actions and beliefs which in reality are dictated by the lower and more fundamental conative tendencies of instinct, emotion, unconscious suggestion, and very early experience, working themselves out by their own perseverating, "determining tendencies." These changes of outlook mark an enormous advance in the progress of psychology; but we may well ask, what immediate interest have they for physiology, how have they been dictated by physiological knowledge, and how can they be absorbed into it?

The truth is that these modern developments of psychology have taken place entirely independently of physiological considerations. We have no idea of the actual neural seat or of the physiological conditions of consciousness. We do not even know what physiological changes occur when a conscious act, by sufficiently repeated experience, becomes an unconscious habit. There is no reason to suppose that we have here a transference of physiological activity from higher to lower neural levels. All our knowledge rather points to the conclusion that under certain conditions consciousness may be present, while under others it may

be absent, when the same nervous areas are thrown into activity. We have indeed no reason to believe that the so-called sensory or sensori-psychic areas¹ are the "seats" of conscious activity at all, although these centres are doubtless indispensable for its manifestation. Just as, if trains must pass through a certain junction to reach their ultimate terminus, we do not identify the junction with the terminus, so we are not justified in identifying cortical centres with the seats of conscious activity.

Physiology can offer no counterpart to the known psychological facts of perseveration, of the irresistibility of emotional force, or of its sublimation to higher and still higher forms. Nor is she concerned in the recognition of two main currents of psychical energy, the one directed outwards towards the external world, the other turned inwards and lost in the intricacies of day-dreaming and concentration on internal experience. These contrary currents of psychical activity have received the names of "extraversion" and "introversion"; and the recognition of their difference and of their pathological variations has thrown much light on the psychology of functional nervous disorders and the insanities. But for the physiologist they have, for the present, at least, no meaning or interest whatever.

Similarly devoid of expression in physiological language are our conceptions of psychical "dissociation" and "regression"; the first, the splitting up of the unified conscious stream into smaller, more or less independent fragments, and the possibilities of co-consciousness, i.e. the coexistence of two or more such fragments in the mind; the second, the backward or involutionary path of mental processes to more infantile conditions.

As I have already urged, the psychologist studies mental processes for their own sake. His remarkably detailed and elaborate researches into the conditions of association—the rate of learning and forgetting, the results of distributing a definite number of repetitions over a longer or a shorter time, the effects of learning a given quantity of matter by sectional or by entire (global) repetitions, the temporary inhibiting or facilitating influences of subsequently learnt associations over earlier ones, the apparent indestructibility of (at least, emotional) memories—are all investigations which the psychologist has carried out and successfully applied in practice, despite our utter ignorance of the physiological basis even of memory. The analysis of the mental work curve, e.g. the recognition, and the attempts at measurement, of the opposing factors of practice, fatigue, incitement, spurt, and settlement, the influence of drugs on mental work, the relations of sensory imagery and speech to thought and of meaning to imagery

¹ Parts of the brain which are definitely associated with sensation and perception.

and perception—all are quite independent of our knowledge of any accompanying nervous activities. Even if we did know the functions and the conditions of activity of every particle of nervous substance within the body, the need for psychological investigations would still remain. Physiology can never describe a mental process, but only the neural process with which it is somehow correlated.

The independence of psychology is even still more evident in its applications. Psychology has now reached the stage of being an Applied Science. In medicine, it has established a new point of view in the treatment of certain mental and nervous disorders, the "psychogenic"¹ character of which has now in many cases been clearly shown, and the cure of which must therefore be conducted primarily from a psycho-therapeutic standpoint. In education, the importance of considering individual interests and mental differences, of investigating the effects of formal training and the relation of general to specific abilities, and of adapting the curriculum to the psychology of the child instead of to that of the adult, has become more and more clearly recognised. In industry, applied psychology is determining the most economical methods of work, alike as regards the best movements to be learnt, the best distribution of periods of work and rest, and the foundation of mental tests which will select those best fitted for different kinds of work. Unfortunately, some of the most ardent advocates of the applications of psychology to education, industry, and medicine have themselves received inadequate training in pure psychology. The consequent initial result has been to establish narrow "schools" of psycho-therapeutics, education, etc., and an uncritical hero-worship of these worthy pioneers. But the more judicially minded psychologist may easily forgive the blind enthusiasm and antagonism which such revolutionary changes have had to meet.

In jurisprudence, psychology is fast making its influence felt. The hitherto unjust criteria of criminal responsibility are being modified in the light of increasing psychological knowledge. The value of legal evidence is being considered in the light of recent psychological experiments on the degree of accuracy, detail, and subjective assurance with which an experience is revived, on the influence of time, suggestion, etc. In art, psychology is founding an experimental science of æsthetics. In biology, psychology has done excellent work on the study of the behaviour of animals, and in ethnology on the study of different races. In religion, in economics, in history, in linguistics, it is likewise fast proving its value. But how are all these instances of the applications of psychology of interest for physiology?

I have left untouched one class of research in which it

¹ Having psychical causation.

might be supposed that psychological knowledge has been dependent on physiological experiment. I refer to the effects of experimental, accidental, or morbid lesions² of the central and peripheral human nervous system upon mental activity. In particular I refer to the striking researches of Henry Head and his collaborators, Rivers, Gordon Holmes, and Riddoch. But these researches are to my mind primarily psychological, not physiological. They have involved the careful application of psychological tests and psycho-physical methods to individuals whose nervous system is no longer intact. They demand psychological rather than physiological training for their final interpretation. Indeed, they have taught the psychologist to be chary of the evidence adduced in the field of physiological psychology. Thus Head's most recent work on aphasia (now on the eve of publication) has given the final death blow to those diagrammatic schemes of speech centres, with their visual, auditory, and kinæsthetic³ memory centres, which physicians so long believed they had scientifically demonstrated and psychologists credulously accepted, under the stultifying influence of bygone notions of the storing up of images in special centres, the mistaken confusion of imagery with meaning and of thought with language, and the erroneous conceptions of separate watertight mental faculties.

Head's earlier work has revealed the complex nature of apparently simple processes, and confirmed the psychologist in his growing disbelief in the sufficiency of ordinary introspection, and in his realisation of the importance of the lower unconscious regions for the effective activity of the higher. It has also afforded valuable examples of the acceptance, inhibition, or fusion of compatible or incompatible sensory processes and of the control exercised by higher over lower mental systems.

Nevertheless, the exact significance of many of the results of these investigations for psychology is quite uncertain. Because a man walks with a certain characteristic gait when certain nervous paths are affected by disease, it would be fallacious to assume that this gait illustrates a primitive form of progression. So, too, because in certain lesions abnormal mental states make their appearance, one must not necessarily infer that these have had an independent existence in man's normal intact ancestry. Again, it would be unsafe to assume, because the existence of two forms of cutaneous⁴ sensibility is indicated by observations chiefly made during the regeneration of divided sensory nerves, that these two systems have separately originated at different periods during men's past evolution. It may

² Lesion, a disturbance of normal structure.

³ Relative to the sensations of movement.

⁴ Relating to the skin.

well be that the protopathic and epicritic¹ systems have been differentiated in man from a single cruder system in which neither can be separately recognised. From a physiological aspect, the distinction of protopathic from epicritic sensibility is, so far, devoid of neurological basis: we cannot say that the one system is related to one set of nerves, the other to another. At the same time, by such investigations physiology has learnt of the existence of a diffuse "massive" reaction in the divided human cord, the progressive grouping and regrouping of various afferent impulses at different levels of the central nervous system, the probable localisation of primary sense qualities, and of crude pleasure, displeasure, and emotion, in the thalamus, and of the more complex sensory and higher mental characters in the cerebral cortex.² In the cortex, indeed, they strongly suggest an entirely novel conception of the principles of localisation.

Interesting as the knowledge of such physiological discoveries is for psychology, this interest is comparable to that of being able to translate the knowledge obtained in one language into another language. The two languages must be regarded as distinct; their relation is uncertain; they do not, of necessity, "think" identically; they must therefore never be confused with one another. Yet at any time the knowledge learnt through

¹ Skin sensation is often supposed to be divisible into a more primitive type known as protopathic, and one more recently developed and more accurate which is known as epicritic.

² The cortex cerebri is the external layer of nerve cells of the "brain," or cerebral hemispheres. The nerve cells of the optic thalamus form connections with the cerebral hemispheres, the cerebellum, and lower levels of the central nervous system.

the one language may be helpful to that learnt through the other, which runs to a certain, but unknown, extent parallel with it. No psychologist can read of the brilliant investigations of Sherrington on reflex action without appreciating their suggestiveness in regard to the course and characters of the higher mental processes in which he is himself concerned. Some day, we may hope, the researches on the behaviour of the intact human and animal organism, which, owing perhaps to their complexity, have been neglected by the physiologist and zoologist and studied almost solely by the psychologist, may be correlated with physiological structure; but the interests of the psychologist and the physiologist must always remain different, the former relating behaviour to *mental* structure, the latter relating it to *bodily* structure.

The day is far distant when consciousness will be correlated with changes in living matter; and, indeed, conceivably it may never arrive. Whether it can arrive or not, psychology will always claim a position of independence, interested, it is true, in the physiology of the nervous system, but closely relating itself to medicine, education, industry, and art, to the study of human institutions and beliefs, and indeed of all processes and products of mental life, in a manner and with an outlook quite distinct from the methods and the standpoint of physiology. The time has come, I submit, when a separate Section of this Association should be devoted to Psychology, grateful though this subject must always remain to the hospitality which Physiology has always offered her, and to the help she has received from Physiology in her advance to the position of an independent Natural Science.